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IS 789 (1971): Ink, drawing, waterproof, black [CHD 14:
Printing, Inks, Stationary and Allied Products]

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IS : 789 - 1971
(Reaffirmed 2010)

Indian Standard
SPECIFICATION FOR
INK, DRAWING, WATERPROOF, BLACK
(First Revision)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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September 1971

AMENDMENT NO. 1 JANUARY 1986

TO

**IS : 739-1971 SPECIFICATION FOR INK, DRAWING,
WATERPROOF, BLACK**

(First Revision)

*(Page 5, clause 3.10) - Substitute the following
for the existing clause:*

'3.10 *Keeping Quality* - The material shall pass the accelerated ageing test described in 3.10.1 and shall keep in usable condition for at least one year from the date of packing.'

[*Page 5, clause 4.2(d)] - Delete the words
'and date'.*

*(Page 5, clause 4.2) - Add the following new
matter after (d):*

'(e) lonth and year of packing.'

(CDC 13)

Indian Standard
SPECIFICATION FOR
INK, DRAWING, WATERPROOF, BLACK
(First Revision)

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Indian Standard
**SPECIFICATION FOR
INK, DRAWING, WATERPROOF, BLACK**
(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 1 April 1971, after the draft finalized by the Inks and Allied Products Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard was originally issued in 1955. The Inks and Allied Products Sectional Committee responsible for its preparation decided to revise it in the light of experience gained through its use. Additional tests for accelerated ageing and clogging have been prescribed. Changes have been made in methods of test and sampling procedure.

0.3 In the original standard, a test to detect the presence of dyes was specified. It was felt that since the object of the test was to prevent the use of dyes which might fade after use, a test for permanence of the ink should be specified.

0.4 For the purpose of deciding whether a particular requirement of this standard is compiled with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS :2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (First Revision) prescribes the requirements and the methods of sampling and tests for ink, drawing, waterproof, black.

*Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

24 For the purpose of this standard, the definitions given in IS : 4395-1967* and IS:4724-1968†, in addition to the following, shall apply:

- a) *Drawing Paper*— Strong and close textured paper of varied qualities and surfaces used for drawing, capable of withstanding steel eraser (*see* IS : 3064-1964‡).
- b) *Tracing Cloth*— A very fine plain-weave cotton fabric treated in a special manner to make it suitable for use as tracing drawings (*see* IS:2037-1962§).
- c) *Tracing Paper*— Paper sufficiently transparent to allow a design to be traced through and reproduced, and intended for this purpose.

3. REQUIREMENTS

3.1 Description— The material shall be composed of carbon in a state of stable suspension in a liquid medium. It may contain a dye in the form of a toner. It shall contain suitable preservative and water-proofing agent.

3.1.1 The material shall not have any adverse effect on the tuft of the artist brush.

3.2 Working Quality— The material on continual use shall not dry in the pen. It shall adhere to drawing paper, cellulose acetate transparent medium for tracing drawing, tracing paper and tracing cloth and shall not penetrate to the other side.

3.3 Sediment— The material shall not show any appreciable settling of the pigment either at the bottom or on the sides, when preserved undisturbed in a closed container for a week.

3.4 Waterproof Quality and Solvent Resistance— The material shall satisfy the test prescribed in Appendix A.

3.5 Opacity— The material shall be opaque and shall comply with the requirements of the test prescribed in Appendix B.

3.6 Performance— The material shall comply with the test prescribed in Appendix C.

3.7 Permanence— The material shall conform to the requirements of the test prescribed in Appendix D.

*Glossary of terms relating to ink and allied industries.

†Glossary of terms relating to printing inks and allied industries.

‡Specification for hand-made drawing paper.

§Specification for tracing cloth.

3.8 Growth of Mould, Thickening and Separation of Pigments —
The material, when tested according to the method prescribed in Appendix E, shall not show any growth of mould, thickening or separation of pigments.

3.9 Clogging — The material shall not clog the pen and shall pass the test prescribed in Appendix F.

3.10 Keeping Quality — The material shall pass the accelerated ageing test described in 3.10.1.

3.10.1 Accelerated Ageing Test — Keep the ink, in sealed bottles, in an air-oven at a temperature of 55°C for a period of one month. At the end of this period, it shall not show any sign of deterioration.

4. PACKING AND MARKING

4.1 Packing — The material shall be packed in glass containers of 15 ml or 30 ml capacity or any other packing as agreed to between the purchaser and the supplier. It shall be furnished with a quill pen securely fixed to the cork sealing the phial, so as to reach the bottom of the phial. The cork shall be of plastic top which may be easily manipulated.

4.2 Marking — Each container shall be marked with the following information:

- a) Name of the material and its colour (black);
- b) Volume in ml;
- c) Name of the manufacturer and/or recognized trade-mark, if any; and
- d) Lot number in code or otherwise to enable the batch and date of manufacture to be traced from records.

4.2.1 The container may also be marked with the Standard Mark

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

5. SAMPLING

5.1 The method of drawing representative samples of the material from a lot, the number of tests to be performed and the criteria of finding the conformity of the material to the requirements of this standard shall be as prescribed in Appendix G.

APPENDIX A (Clause 3.4)

TEST FOR WATERPROOF QUALITY AND SOLVENT RESISTANCE

A-1. PROCEDURE

A-1.0 The test shall be carried out with a clean line pen.

A-1.1 Draw a few lines (0.5 mm thick, 5 mm apart and 150 mm long) or figures or both on the matt side of (a) cellulose acetate transparent medium for tracing drawings, (b) drawing paper, (c) tracing cloth, and (d) tracing paper. Mark off the drawing into two equal parts, allow to dry for 12 hours and then subject to the following tests. Make the tests on sections selected from each one of the two equal parts.

A-1.1.1 Place four drops of water and spread them over the drawing for a length of about 25 mm applying no rubbing or friction. Allow the drawing to dry normally. There shall be no spreading of ink or reduction of colour.

A-1.1.2 Soak the drawing for a length of about 25 mm with water by a sponge and then blot them with a clean piece of blotting paper. There shall be no stain on the blotting paper.

A-1.1.3 Place four drops of petrol, benzene or carbon tetrachloride, and spread them over the drawing which has been allowed to dry for a further period of 12 hours to a length of about 25 mm applying no rubbing or friction. Repeat the operation, if necessary, to keep the surface wet for at least 5 minutes. There shall be no spreading of ink or reduction of colour.

APPENDIX B (Clause 3.5)

TEST FOR OPACITY

B-1. PROCEDURE

B-1.1 Draw a few lines or figures or both on the dull side of a tracing cloth and wait till these dry up completely. Hold the tracing cloth against a strong lighted background and examine whether these lines or figures or both are opaque.

APPENDIX C

(Clause 3.6)

TEST FOR PERFORMANCE

C-1. PROCEDURE

C-1.1 The test shall be carried out with a clean line pen.

C-1.2 Set the pen (preferably with an opening of approximately 0.08 mm) and fill it with sufficient ink to draw a few lines or figures or both (preferably more than 5 lines, each about 150 mm long and approximately 5 mm apart) on the matt side of (a) drawing paper, (b) tracing cloth, (c) tracing paper, and (d) cellulose acetate transparent medium for tracing drawings. The ink shall be considered unserviceable, if it is not possible to draw sharp and well-defined edges, without special effort to promote the flow of the ink.

C-1.2.1 Four minutes after the lines or figures have been drawn, rub them with finger tips previously washed with ethyl ether. There shall be no blurring or smudging. They shall also be free from a tendency to flake off.

C-1.3 Set the pen with an opening of approximately 0.5 mm and draw 10 parallel lines (preferably 50 mm long and 5 mm apart) on the matt side of cellulose acetate transparent medium for tracing drawings, drawing paper, etc. After allowing these lines to dry for a reasonable time (say, for ten minutes) draw a few lines or figures or both of the same width and length or dimensions at right angles to the parallel lines already drawn. (The pen should always be filled with, as nearly as possible, the same volume of ink, and there shall be no change in the setting of the pen at any time, during the progress of this test. The ruler used shall have a square edge, that is, it shall not be bevelled.) The material shall be considered to have passed the test if it conforms to the requirements laid down in C-1.3.1 to C-1.3.3 below.

C-1.3.1 The ends of the lines shall show no noticeable non-uniformity in width.

C-1.3.2 There shall be no marked variation in the thickness of the lines of any one surface.

C-1.3.3 The intersecting lines shall be free from distortion or blots caused by the ink, and/or any spreading under the ruling edge.

C-1.4 Erase with an eraser a reasonable length of line, say 25 mm in length and 0.5 mm in thickness, drawn on the matt side of the tracing cloth **and** tracing paper.

C-1.4.1 The ink shall be regarded as not acceptable, if it is not possible to secure complete erasure without leaving any stain.

A P P E N D I X D

(Clause 3.7)

TEST FOR PERMANENCE

D-1. PROCEDURE

D-1.1 Cut into two portions the paper and the cloth upon which the test under C-1.2 has been made. Expose one strip each of the drawing paper, tracing cloth, tracing paper and cellulose acetate transparent medium to an ultraviolet lamp for a total period of 48 hours at room temperature. The strips shall be placed at a distance of 250 mm normal to the rays. The lamp shall be of 125 watts, 125 volts, 1.15A current and long wave length UV region chiefly at 3655\AA .

D-1.1.1 The ink shall satisfy the requirements of the test if there is no evidence of fading when compared with the original unexposed strips.

A P P E N D I X

(Clause 3.8)

TEST FOR GROWTH OF MOULD, THICKENING AND SEPARATION OF PIGMENTS

E-1. PROCEDURE

E-1.1 Transfer 5 ml of the material into a 50-ml beaker and inoculate with spores of (a) *Aspergillus niger*, (b) *Pullularia pullulans*, and (c) *Penicillium pinophilum*. Keep it in a moist chamber for two weeks at $37 \pm 1^\circ\text{C}$. After the expiry of this period the ink shall not show any growth of moulds, thickening or separation of pigments.

A P P E N D I X F

(Clause 3.9)

TEST FOR FREEDOM FROM CLOGGING

F-1. PROCEDURE

F-1.1 Set the line pen with an opening of approximately 0.5 mm and fill it with sufficient ink. Draw 5 parallel lines of 50 mm long each and

about 5 mm apart on tracing paper. As soon as the drawing of the fifth line is completed, start the stop-watch and count 30 seconds. At the end of 30 seconds, once again draw 5 lines continuously each of 50 mm long and 5 mm apart.

F-1.1.1 The ink shall be considered to have conformed to the requirements of the test if it is possible to draw 5 clear lines after the interval of 30 seconds.

A P P E N D I X G

(Clause 5.1)

SAMPLING OF INK, DRAWING, WATERPROOF, BLACK

G-1. GENERAL REQUIREMENTS OF SAMPLING

G-1.0 In drawing, preparing, storing and handling test samples, the following precautions and directions shall be observed.

G-1.1 Samples shall not be taken in an exposed place.

G-1.2 The sampling instrument shall be clean and dry when used.

G-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples, from adventitious contamination.

G-1.4 To draw a representative sample, the contents of each bottle selected for sampling shall be thoroughly mixed.

G-1.5 The samples shall be filled in clean, dry, air-tight glass containers on which the material has no action.

G-1.6 The sample containers shall be of such a size that they are almost completely filled by the sample.

G-1.7 Each sample container shall be sealed air-tight with a stopper after filling, and marked with full particulars of the material as given in 4.2 and the date of sampling.

G-1.8 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

G-2. SCALE OF SAMPLING

G-2.1 Lot—All the bottles of the same size in a single consignment from the same batch of manufacture shall constitute a lot.

G-2.1.1 Samples shall be tested from each lot for ascertaining the conformity of the material to the requirements of the specification.

G-2.2 The number (n) of bottles to be chosen from a lot shall depend on the size of the lot and shall be in accordance with Table 1.

TABLE 1 SCALE OF SAMPLING
(*Clause G-2.2*)

LOT SIZE (N)	NO. OF BOTTLES TO BE SELECTED (n)
Up to 15	2
16 " 50	3
51 " 150	5
151 and above	8

G-2.3 These bottles shall be chosen at random from the lot and to ensure randomness of selection, random number tables shall be used (*see IS : 4905-1968**). In case such tables are not available, the following procedure may be adopted.

G-2.4 Starting from any bottle count them as 1, 2, 3, etc, up to r and so on, in one order. Every r th bottle thus counted shall be withdrawn to give a sample for test, where r is the integral part of N/n (N being the lot size and n the number of bottles to be chosen from the lot).

G-3. TEST SAMPLES AND REFEREE SAMPLES

G-3.1 Before drawing the samples, the material in the bottles chosen (*see G-2.2*) shall be thoroughly mixed by shaking or stirring or rolling. Samples shall then be drawn with the help of a suitable sampling instrument.

G-3.2 From each of the bottles three test samples shall be drawn, the volume of each sample being sufficient to conduct all the tests specified in **3.2** to **3.10**. All the test samples thus obtained shall be transferred to sample containers (*see G-1.5*) and marked with all the details of sampling (*see G-1.7*). These samples shall then be separated into three identical sets of test samples in such a way that each set has a test sample representing each bottle selected (*see G-2.2*). One of these three sets shall be for the purchaser, another for the supplier, and the third for the referee.

G-3.3 Referee Sample—Referee sample shall consist of the set of test samples, (*see G-3.2*) marked for this purpose and shall bear the seals of both the purchaser and the supplier and shall be kept at a place agreed to between the two.

G-4. NUMBER OF TESTS

G-4.1 Tests for all the requirements of the specification given in **3.2** to **3.10** shall be conducted on each of the samples in a set.

G-5. CRITERIA FOR CONFORMITY

G-5.1 A lot shall be declared as conforming to the requirements of the specification if each of the test result satisfies all the relevant requirements of the specification individually.

*Methods for random sampling.

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones 323 0131, 323 3375, 323 9402 Fax + 91 011 3234062, 3239399, 3239382

E - Mail bis@vsnl.com **Website** http://www.bis.org.in

Central Laboratory:

Plot No 20/9, Site IV, Sahibabad Industrial Area, Sahibabad 201010

Telephone 477 0032

Regional Offices:

Central Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	323 76 17
*Eastern 1/14 CIT Scheme VII, V I P Road, Kankurgachi, CALCUTTA 700054	337 86 62
Northern SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43
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†Western Manakalaya, E9, MIDC, Behind Marol Telephone Exchange, Andher (East), MUMBAI 400093	332 92 95

Branch Offices:

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5-8-56C L N Gupta Marg, Nampally Station Road HYDERABAD 500001	320 10 84
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TC No 14/1421, University PO Palayam, THIRUVANANTHAPURAM 695034	32 21 04
<hr/>	
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